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PROCEEDINGS
OF
THE ROYAL SOCIETY.

1836.

No. 26.

June 2, 1836.

DAVIES GILBERT, Esq., V.P., in the Chair.

A paper was read, entitled "Note relative to the supposed origin of the deficient rays in the Solar Spectrum; being an account of an experiment made at Edinburgh during the Annular Eclipse of May 15, 1836." By James D. Forbes, Esq., Professor of Natural Philosophy in the University of Edinburgh.

The observation that some of the rays of light, artificially produced, are absorbed by transmission through nitrous acid gas, had suggested to Sir David Brewster the idea that the dark spaces in the solar prismatic spectrum may, in like manner, be occasioned by the absorption of the deficient rays during their passage through the sun's atmosphere. It occurred to the author that the annular eclipse of the sun of the present year would afford him an opportunity of ascertaining whether any difference in the appearance of the spectrum could be detected when the light came from different parts of the solar disc, and had consequently traversed portions of the sun's atmosphere of very different thickness; and that accurate observations of this kind would put the hypothesis in question to a satisfactory test. The result of the experiment was that no such differences could be perceived; thus proving, as the author conceives, that the sun's atmosphere is in no way concerned with the production of the singular phenomenon of the existence of dark lines in the solar spectrum.

A paper was also read, entitled "On the connexion of the anterior columns of the Spinal Cord with the Cerebellum; illustrated by preparations of these parts in the Human subject, the Horse, and the Sheep." By Samuel Solly, Esq., Lecturer on Anatomy and Physiology at St. Thomas's Hospital, M.R.I., Fellow of the Royal Medical and Chirurgical Society, and Member of the Hunterian Society. Communicated by P. M. Roget, M.D., Sec. R.S.

The exact line of demarcation between the tracts of nervous matter, subservient to motion and to sensation, which compose the spinal cord, has not yet been clearly determined. The proofs which exist of a power residing in the cerebellum which regulates and controls the

actions of muscles, would lead us to suppose that the fibres of the motor nerves are continuous with those of the cerebellum ; but hitherto no observations have been made which prove the existence of this connexion ; and it is the object of the author, in this paper, to establish, by a more careful examination of the anatomical structure of this part of the nervous system, such continuity of fibres between the anterior columns of the spinal cord and the cerebellum. The corpora pyramidalia have been hitherto considered as formed by the entire mass of the anterior, or motor columns of the spinal cord ; but the author shows that not more than one half of the anterior columns enters into the composition of these bodies : and that another portion, which he terms the *antero-lateral* column, when traced on each side in its progress upwards, is found to cross the cord below the corpora olivaria, forming, after mutual decussation, the surface of the corpora restiformia ; and ultimately being continuous with the cerebellum. These fibres are particularly distinct in the medulla oblongata of the sheep and of the horse. The author conceives that the office of the antero-lateral columns is to minister to the involuntary, as well as to the voluntary movements : that the facial nerve arises from both the voluntary and involuntary tracts ; and that the pneumogastric nerve arises both from the involuntary and the sensory tracts.

June 9, 1836.

FRANCIS BAILY, Esq., V.P. and Treasurer, in the Chair.

“ Discussion of the Magnetical Observations made by Captain Back, R.N., during his late Arctic Expedition. By Samuel Hunter Christie, Esq., M.A., F.R.S.

The author, having been consulted by Captain Back, previous to the departure of the latter, in 1833, with the expedition for the relief of Captain Ross, respecting the nature of the magnetical observations which it might be desirable to make in the regions he was about to visit, and considering that, with a view to the attainment of the principal object of the expedition, the greatest economy of time in making these observations was of the first importance, limited his suggestions, in the first instance, to the methods proper to be employed for determining the direction and the dip of the needle, but more especially the latter. Captain Back, immediately on his return, placed all his magnetical observations at the disposal of Mr. Christie, who having since completed their reduction, gives, in the present paper, the results of his labours.

The first part of the paper relates to the observations of the Dip of the magnetic needle. With a view to economize as much as possible the time consumed in making each observation, the process of inverting the poles of the needle, which is usually resorted to in each instance, was here dispensed with. But in order that the dip may be determined independently of this operation, it is necessary not only that the position of the centre of gravity of the needle employed should be ascertained, but that it should be permanent. In giving an account of the observations made to verify this condition, the author com-